

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A design support system, comprising:

a database which divides a history of design work for creating a shape model, comprising a first reference surface, for each part of the shape model and holds a plurality of design work histories as unit work history data, the database accumulating technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data; and

a control section configured to:

fetch at least two unit work history data selected from the plurality of unit work history data held by the database;

combine the at least two selected unit work history data and output design work data for creating a combined shape model, comprising a second reference surface, which is formed by sequentially reproducing the selected unit work history and joining part shape models corresponding to the respective selected unit work history data;

create a corresponding surface group in accordance with user input of a correspondence;

determine, using the corresponding surface group, errors in the combined shape model arising from the second reference surface;

compute at least one technical characteristic value of the combined shape model which is created from the output design work data; and

compare the computed technical characteristic value with the technical conditions related to unit work history data which is the origin of the design work data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the combined shape model, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

2. (Currently Amended) A design support system which outputs work data for creating a shape model, comprising a first reference surface, of a design target in order to create the shape model of the design target conforming to a standard shape, comprising:

a database which holds a plurality of unit work history data which are obtained by dividing a history of a design work performed with reference to a first standard shape for each design work history corresponding to a shape model of a predetermined portion, the database accumulating technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data; and

a control section configured to:

receive designation of data about a second standard shape;
fetch multiple unit work history data held by the database;

combine each of the fetched unit work history data, sequentially reproduce unit work history data, reproduce design work with reference to the designated second standard shape for the design works performed with reference to the first standard shape among the design works contained in the unit work history data, and output work data corresponding to a combined shape model, comprising a second reference surface conforming to the second standard shape;

create a corresponding surface group in accordance with user input of a correspondence;

determine, using the corresponding surface group, errors in the combined shape model arising from the second reference surface;

compute at least one technical characteristic value of the combined shape model which is created from the output work data; and

compare the computed technical characteristic value with the technical conditions related to unit work history data which is the origin of the work data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the combined shape model, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

3. (Canceled)

4. (Canceled)

5. (Previously Presented) The design support system according to claim 2, wherein the control section is further configured to:

receive designation of data about a third standard shape; wherein:

the work data is converted by reproducing a design work with reference to the designated third standard shape for work included in the work contained in the output work data and performed with reference to the second standard shape, and converted work data corresponding to the shape model conforming to the third standard shape is output.

6. (Previously Presented) The design support system according to claim 1, wherein the control section is further configured to:

analyze the history of design work and extract input work carried out by a person in charge of work when unit historical data is created; and the design support system further including:

a display section which shows the extracted input work to the person in charge of work to request input of design support information; and

a database which records the design support information in a history of the design work and divides the history of the design work into unit historical data when the design support information is input.

7. (Currently Amended) A design support system which holds a series of design work

histories to reuse as work history data and creates a shape based on the work history data, comprising:

a control section which:

analyzes the work history data, comprising a first reference surface, by sequentially reproducing unit work history data to extract input work, comprising a second reference surface, carried out by a person in charge of work,
creates a corresponding surface group in accordance with user input of a correspondence,

determines, using the corresponding surface group, errors in the extracted input work arising from the second reference surface,

computes at least one technical characteristic value of the shape which is created based on the work history data, and

compares the computed technical characteristic value with technical conditions related to the work history data, wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape;

a display section which shows the extracted input work to the person in charge of work to request input of design support information; and

a database which records the design support information in the work history data when the design support information is input, the database accumulating technical conditions, which are to be met by the shape created based on the work history data, in association with the work history data;

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

8. (Previously Presented) The design support system according to claim 7, wherein the database is further configured to:

generate unit work history data by dividing the work history data into predetermined work units for a design target.

9. (Previously Presented) A design support system, comprising:

a database which accumulates unit work history data which is formed by dividing a history of past design work, comprising a first reference surface, into work units determined for a design target and contains design support information related to input work among the design work, the database accumulating technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data;

a control device section configured to:

selectively show the unit work history on a display section upon receiving designation of the design target;

create a shape comprising a second reference surface by sequentially reproducing the selected unit work history;

provide design support information related to input work when the input work is demanded while the unit work history is being reproduced;

create a corresponding surface group in accordance with user input of a correspondence;

determine, using the corresponding surface group, errors in the shape arising from the second reference surface;

compute at least one technical characteristic value of the shape which is created from the unit work history data; and

compare the computed technical characteristic value with the technical conditions related to unit work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

10. (Previously Presented) The design support system according to claim 9, wherein the control section is further configured to:

judge whether the work history to be reproduced agrees with predetermined guidance display conditions while the unit work history is being reproduced; and wherein

the display section is further configured to implement a guidance display determined in connection with the guide display conditions if the work history agrees with the guidance display conditions.

11. (Previously Presented) A design support system, comprising:
 - a database which accumulates unit work history data which is formed by dividing a history of past design work into work units, comprising a first reference surface, determined for a design target and contains design support information related to an input work among the design work, the database accumulating technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data;
 - a first display device which shows a shape comprising a second reference surface of the design target obtained by sequentially reproducing a history of the design work with reference to the unit work history data;
 - a second display device which shows design support information contained in the unit work history data by reproducing a history of a design work prior to the reproduction at the first display device; and
 - a control section which:
 - creates a corresponding surface group in accordance with user input of a correspondence;
 - determines, using the corresponding surface group, errors in the shape arising from second reference surface;
 - computes at least one technical characteristic value of the shape which is created by sequentially reproducing the history of the design work with reference to the unit work history data, and

compares the computed technical characteristic value with the technical conditions related to unit work history; wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape, and wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

12. (Currently Amended) A design support method using a computer, wherein:
 - a series of design work histories are held in multiple quantities as work history data, comprising a first reference surface, in a database in order to create a part shape model;
 - technical conditions are accumulated in the database, which are to be met by the part shape model to be created according to each work history data, in association with each work history data;
 - at least two selected work history data are fetched from the held multiple work history data according to an instruction input to a processor;
 - design work data for creating a one-piece shape model comprising a second reference surface by sequentially reproducing unit work history data and combining the at least two fetched work history data and connecting part shape models corresponding to the respective work history data is output;
 - a corresponding surface group is created by a control section in accordance with user input of a correspondence;

errors in the one-piece shape model arising from the second reference surface are determined, using the corresponding surface group, by the control section; at least one technical characteristic value of the one-piece shape model which is created from the design work data is computed; and the computed technical characteristic value is compared with the technical conditions related to work history data which is the origin of the design work data; wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the one-piece shape model, and wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

13. (Currently Amended) A design support method which uses a computer to create a shape model of a design target conforming to a desired standard shape according to input to its processor and outputs work data for creating the shape model of the design target, comprising the steps of:

holding a plurality of histories of design work performed in the past with reference to the respective standard shapes, comprising a first reference surface, in a database as work history data;

accumulating in the database technical conditions, which are to be met by a part shape model to be created according to each work history data, in association with each work history data;

accepting designation of data about a second standard shape, which is a desired standard shape, according to an instruction input to the processor;

fetching the selected multiple work history data from the multiple work history data held in the database;

combining respective pieces of the fetched work history data, sequentially reproducing sequentially reproducing unit work history data, reproducing design work with reference to the designated second standard shape for the design work performed in the past with reference to the respective standard shapes among the design work contained in the work history data, and outputting work data corresponding to a combined shape model, comprising a second reference surface, conforming to the second standard shape;

creating a corresponding surface group;

determining, using the corresponding surface group, errors in the combined shape model arising from the second reference surface;

computing at least one technical characteristic value of the combined shape model which is created from the fetched work history data; and

comparing the computed technical characteristic value with the technical conditions related to work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the combined shape model, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

14. (Currently Amended) A design support method which holds a series of design work histories as work history data in order for reuse and generates a shape by a computer according to the work history data according to an instruction input to a processor, comprising the steps of:

 accumulating in a database technical conditions, which are to be met by a part shape model to be created according to each work history data, comprising a first reference surface, in association with each work history data;

 analyzing the work history data by sequentially reproducing unit work history data upon input to the processor to extract the input work, comprising a second reference surface, performed by a person in charge of work;

 showing the extracted input work to the person in charge of work to request input of design support information;

 when the design support information is input, recording the design support information in the work history data;

 creating a corresponding surface group;

 determining, using the corresponding surface group, errors in the extracted input work arising from the second reference surface;

 computing at least one technical characteristic value of the shape which is created from the work history data; and

 comparing the computed technical characteristic value with the technical conditions related to work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape, and wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

15. (Previously Presented) A design support method, comprising the steps of:

accumulating, using a computer, unit work history data which is formed by dividing a history of past design work into work units, comprising a first reference surface, determined for a design target and contains design support information related to input work among the design work;

accumulating, using the computer, technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data;

showing the unit work history selectively upon receiving designation of the design target by the computer;

creating a shape, comprising a second reference surface, by sequentially reproducing the selected unit work history;

providing the design support information related to input work when the input work is demanded while the unit work history is being reproduced;

creating a corresponding surface group;

determining, using the corresponding surface group, errors in the shape arising from the second reference surface;

computing at least one technical characteristic value of the shape which is created from the unit work history; and

comparing the computed technical characteristic value with the technical conditions related to unit work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

16. (Original) The design support method according to claim 15, wherein it is judged whether the work history to be reproduced conforms to predetermined guidance display conditions while the unit work history data is being reproduced by the computer and, if it conforms to the guidance display conditions, a guidance display determined in connection with the guide display conditions is performed.

17. (Currently Amended) A recording medium storing a design support program and being computer-readable, the design support program comprising:

 a module holding a series of design work histories as a plurality of work history data, comprising a first reference surface, for creation of a part shape model, comprising a second reference surface;

 a module accumulating technical conditions, which are to be met by the part shape model;

a module fetching at least two selected work history data from the held multiple work history data;

a module outputting design work data for creating a one-piece shape model by sequentially reproducing unit work history data and combining the at least two fetched work history data and connecting part shape models corresponding to the respective work history data;

a module creating a corresponding surface group in accordance with user input of a correspondence;

a module determining, using the corresponding surface group, errors in the part shape model arising from the second reference surface;

a module computing at least one technical characteristic value of the one-piece shape model which is created from the design work data; and

a module comparing the computed technical characteristic value with the technical conditions related to work history data which is the origin of the design work data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the one-piece shape model, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

18. (Currently Amended) A recording medium storing a design support program and being computer-readable, the design support program comprising:

a module outputting work data for creating a shape model of a design target in order to create the shape model of the design target conforming to a desired standard shape;

a module holding a history of design work performed with reference to a first standard shape, comprising a first reference surface, as a plurality of work history data;

a module accumulating technical conditions, which are to be met by the shape model;

a module receiving designation of data about a second standard shape, comprising a second reference surface, which is a desired standard shape;

a module fetching the selected multiple work history data from the held multiple work history data;

a module combining each of the fetched work history data, sequentially reproducing unit work history data, reproducing design work with reference to the designated second standard shape for the design works performed with reference to the first standard among the design works contained in the work history data, and outputting work data corresponding to a one-piece shape model conforming to the second standard shape;

a module creating a corresponding surface group in accordance with user input of a correspondence;

a module determining, using the corresponding surface group, errors in the second standard shape caused by the second reference surface;

a module computing at least one technical characteristic value of the one-piece shape model which is created from the design work; and

a module comparing the computed technical characteristic value with the technical conditions related to work history data which is the origin of the design work; wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the one-piece shape model, and wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

19. (Currently Amended) A recording medium storing a design support program and being computer-readable, the design support program comprising:

a module holding a series of design work histories, comprising a first reference surface, to reuse as work history data;

a module accumulating technical conditions, which are to be met by a part shape model to be created according to each work history data, in association with each work history data;

a module analyzing the work history data by sequentially reproducing unit work history data to extract input work performed by a person in charge of work;

a module showing the extracted input work, comprising a second reference surface, to the person in charge of work to request input of design support information;

a module recording the design support information in the work history data when the design support information is input;

a module creating a corresponding surface group in accordance with user input of a correspondence;

a module determining, using the corresponding surface group, errors in the extracted input work arising from the second reference surface;

a module computing at least one technical characteristic value of the extracted input work which is created from the work history data; and

a module comparing the computed technical characteristic value with the technical conditions related to work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the extracted input work, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

20. (Previously Presented) A recording medium storing a design support program and being computer-readable, the design support program comprising:

a module accumulating unit work history data which is formed by dividing a history of past design work into work units, comprising a first reference surface, determined for a design target and contains design support information related to input work among the design work;

a module accumulating technical conditions, which are to be met by a part shape model to be created according to each unit work history data, in association with each unit work history data;

a module selectively showing the unit work history upon receiving designation of the design target;

a module creating a shape, comprising a second reference surface, by sequentially reproducing the selected unit work history;

a module providing design support information related to an input work when the input work is demanded while the unit work history is being reproduced;

a module creating a corresponding surface group in accordance with user input of a correspondence;

a module determining, using the corresponding surface group, errors in the shape arising from the second reference surface;

a module computing at least one technical characteristic value of the shape which is created from the unit work history data; and

a module comparing the computed technical characteristic value with the technical conditions related to unit work history data;

wherein the computation of the at least one technical characteristic value comprises analyzing the strength of the shape, and

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.

21. (Original) The recording medium being computer-readable according to claim 20, wherein:

the design support program in the recording medium further includes a module judging whether the work history to be reproduced agrees with predetermined guidance display conditions while the unit work history is being reproduced and, if the work history

agrees with the guidance display conditions, implements a guidance display determined in connection with the conditions.

22. (Currently Amended) A design support system, comprising:

a database which divides a history of design work for creating a shape model, comprising a first reference surface, for each part of the shape model and holds a plurality of design work histories as unit work history data; and

a control section configured to:

fetch at least two unit work history data selected from the plurality of unit work history data held by the database;

combine the at least two selected unit work history data and output design work data for creating a combined shape model, comprising a second reference surface, which is formed by sequentially reproducing the unit work history data and joining part shape models corresponding to the respective unit work history data;

create a corresponding surface group in accordance with user input of a correspondence; and

determine, using the corresponding surface group, errors in the combined shape model arising from the second reference surface;

wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface.